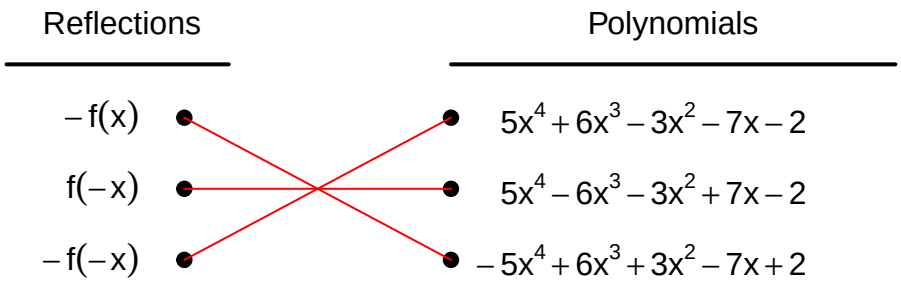
Name: Date:

Exam: Function Reflections (Solution version 29)

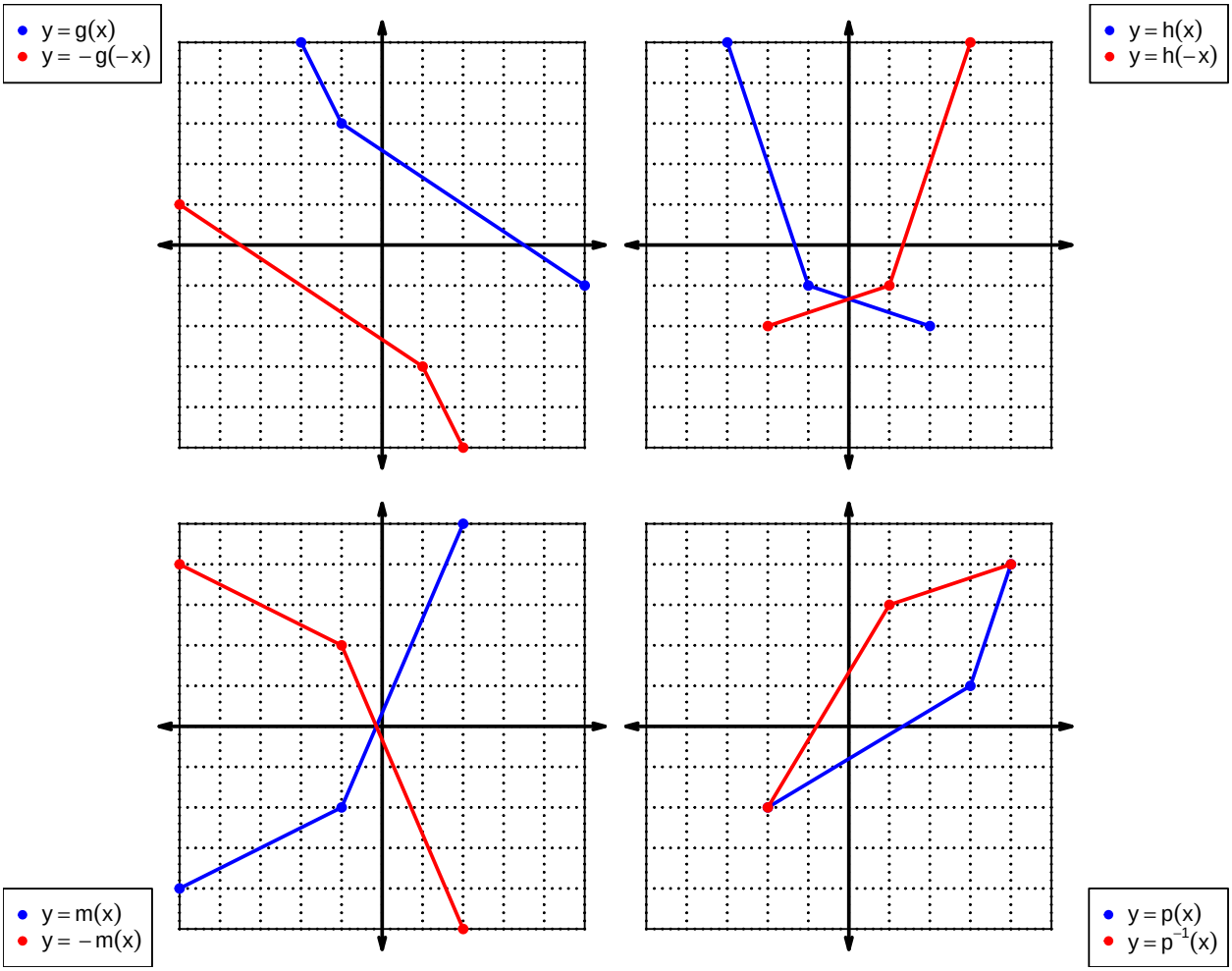
1. Let function f be defined by the polynomial below:

$$f(x) = -5x^4 - 6x^3 + 3x^2 + 7x + 2$$

Draw lines that match each function reflection with its polynomial:



2. In each xy plane shown below, a function is graphed with blue. Draw the indicated reflections (as a second curve, indicated in legend) with black (or with whatever you have). The x axis is horizontal and the y axis is vertical (as typical), and the scale is equal on both axes.



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For all questions on this page, the functions f, g, and h are defined by the table below.

x	$f(x)$	$g(x)$	$h(x)$
1	1	7	3
2	8	6	4
3	9	2	9
4	7	9	1
5	6	3	2
6	3	4	8
7	5	5	7
8	4	1	5
9	2	8	6

3. Evaluate $f(9)$.

$$f(9) = 2$$

4. Evaluate $g^{-1}(3)$.

$$g^{-1}(3) = 5$$

5. By filling more rows of the table, it is possible to make function f **even**. If that were done, what would be the value of $f(-6)$?

If function f is even, then

$$f(-6) = 3$$

6. By filling more rows of the table, it is possible to make function h **odd**. If that were done, what would be the value of $h(-7)$?

If function h is odd, then

$$h(-7) = -7$$

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7. A function, f, is **even** if $f(x) = f(-x)$ for all x in the domain. A function, g, is **odd** if $g(x) = -g(-x)$ for all x in the domain.
   Let polynomial p be defined with the following equation:

$$p(x) = -x^2 - x$$

   a. Express $p(-x)$ as a polynomial in standard form.

$$p(-x) = -(-x)^2 - (-x)$$
$$p(-x) = -x^2 + x$$

   b. Express $-p(-x)$ as a polynomial in standard form.

$$-p(-x) = -\left(-x^2 + x\right)$$
$$-p(-x) = x^2 - x$$

   c. Is polynomial p even, odd, or neither?

   neither

   d. Explain how you know the answer to part c.

   We see that $p(x)$ is not equivalent to either $p(-x)$ or $-p(-x)$, so p is neither even nor odd.

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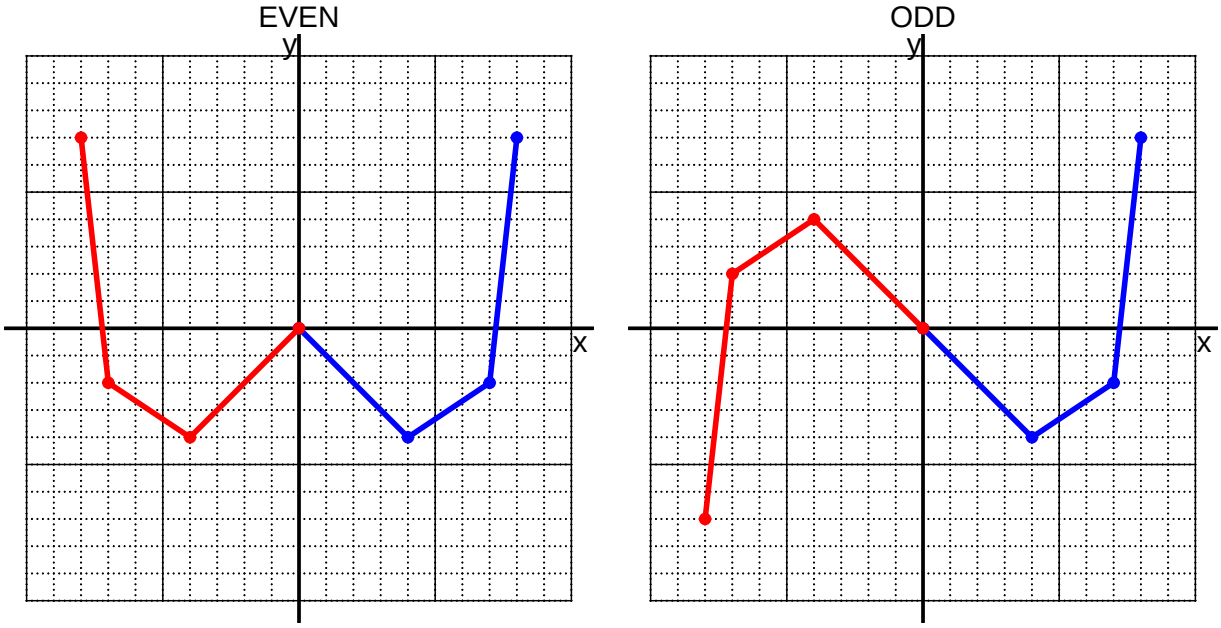
8. I have drawn half of a function. Draw the other half to make it even or odd.



9. Let function f be defined with the equation below.

$$f(x) = 5(x-7)$$

a. Evaluate $f(23)$.

step 1: subtract 7
step 2: multiply by 5

$$f(23) = 5((23)-7)$$
$$f(23) = 80$$

b. Evaluate $f^{-1}(40)$.

step 1: divide by 5
step 2: add 7

$$f^{-1}(x) = \frac{x}{5} + 7$$
$$f^{-1}(40) = \frac{(40)}{5} + 7$$
$$f^{-1}(40) = 15$$

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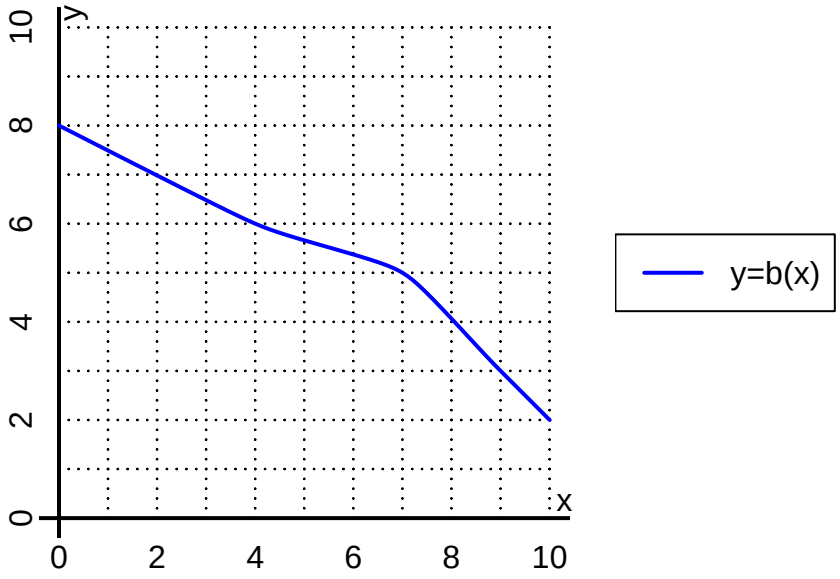
10. The function b is represented by the curve $y = b(x)$ graphed below.



a. Evaluate $b(4)$.

$b(4) = 6$

b. Evaluate $b^{-1}(5)$.

$b^{-1}(5) = 7$

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11. Function f is defined by the table below.

    a. Complete the columns for $-f(x)$ and $f(-x)$ and $-f(-x)$.

x	$f(x)$	$-f(x)$	$f(-x)$	$-f(-x)$
-2	-8	8	8	-8
-1	5	-5	-5	5
0	0	0	0	0
1	-5	5	5	-5
2	8	-8	-8	8

b. Is function f even, odd, or neither?

odd

c. How do you know the answer to part b?

Function f is odd because column $-f(-x)$ matches column $f(x)$ exactly.